Amendments To The Claims

The listing of claims presented below will replace all prior versions, and listings, of claims in the application.

Listing of claims:

1. (**currently amended**) A garbage data collection method performed during a communication cycle of a plurality of communication cycles of a computing device having memory including writeable non-volatile memory, the garbage data collection method comprising:

performing a mark phase during a communication cycle, the mark phase for making a first list**, the first list being an address list including addresses** of objects to be deleted from ~~the entire writeable non-volatile memory space~~ **the memory**;

performing a first sweep phase during the communication cycle ~~for deleting the listed objects of~~ **to delete objects listed in** the first list from the memory, wherein the performing of the sweep phase comprises:

calculating a residual time up to a predetermined time limit after processing an external command;

after calculating the residual time, deleting ~~the listed~~ objects **listed in the** ~~of the~~ first list from the memory **during** ~~within~~ the calculated residual time; and

updating the first list ~~of objects to list those undeleted~~ **to include addresses of remaining** objects **listed in the** ~~of the~~ first list **of objects to be deleted** which **cannot be deleted within** ~~remain after the lapse of~~ the calculated residual time, and storing the updated first list in the **memory separately from the objects so as to prevent deletion of the first list.** ~~memory and wherein,~~

~~If objects to be deleted remain after performing the mark phase and the first sweep phase during the communication cycle, performing only a sweep phase during subsequent communication cycles until all the objects of the first list are deleted from the memory.~~

2. (previously presented) The method of claim 1, wherein the time limit is

determined by a host that transmits the external command or the time limit is determined to be a period of time up to a time guaranteeing QoS that a user does not feel a response delay to the external command.

3. (previously presented) The method of claim 1, wherein the act of making the first list is performed when a garbage collection is requested or when a communication session for receiving the external command is initialized.

4. (**currently amended**) The method of claim 1, wherein the act of making the list of objects comprises:

adding to the first list **an address of an object that was to be deleted** ~~**any object earmarked for deletion**~~ in a prior communication cycle but **remains** ~~**remaining**~~ in the memory undeleted.

5. (**currently amended**) The method of claim 1, wherein the act of making the list of the objects comprises:

updating the first list ~~**of objects**~~ when an object is newly generated or deleted during the command processing.

6. (**currently amended**) The method of claim 1, wherein the act of deleting the objects of the first list comprises:

making a second list **including addresses** of objects to be deleted from the memory during any residual time ~~remaining~~ after deleting all objects **listed** in the first list.

7. (**currently amended**) The method of claim 1, further comprising:

during the communication cycle, deleting objects **listed on** ~~**of an**~~ existing list ~~**of objects listing**~~ **which remain** undeleted **after** ~~**objects of**~~ a prior communication cycle before the external command is processed.

8. (**currently amended**) The method of claim 1, further comprising:

if the command includes a memory write command or an object delete command, and if there is a list **including addresses** of objects to be deleted from the memory before the write or delete command is processed, performing the deleting of the objects together with the write or delete command.

9. **(currently amended)** The method of claim 1, wherein the deleting of **[[the]]** listed objects comprises:

if the objects **listed** in the first list exist in the memory in a consecutive order, deleting the consecutively ordered objects all together, and if a memory space to be allocated for an object and a memory space of the objects **listed** in the first list are consecutively ordered memory spaces or the same memory space, performing the acts of allocating and deleting together.

10. **(currently amended)** A garbage collection apparatus comprising:

a timer, which calculates a residual time up to a predetermined time limit after processing an external command; and

a memory management unit, which performs a mark phase during a communication cycle, the mark phase for making a list **including addresses** of objects to be deleted from ~~an entire writeable non-volatile memory space~~ **a memory**, and performs a first sweep phase during the communication cycle for deleting ~~the listed~~ objects **listed on the** ~~of the first~~ list from the memory, wherein the sweep phase comprises deleting ~~the listed~~ objects **listed on the** ~~of the~~ list from the memory **during** ~~within~~ the calculated residual time, updating the list **to include addresses** of **remaining** objects **listed in the list of objects which cannot be deleted within** ~~to list those undeleted objects of the first list after~~ the lapse of the calculated residual time, and storing the updated ~~first~~ list in **memory separately from the objects so as to prevent deletion of the first list.** ~~memory, and wherein, if objects to be deleted remain after performing the mark phase and the first sweep phase during the communication cycle, performing only a sweep phase during subsequent communication cycles until all the objects of the first list are deleted from the memory.~~

11. (**currently amended**) The apparatus of claim 10, wherein the memory management unit deletes objects **listed on an ~~of an~~** existing list **which includes addresses** of objects **which remain ~~listing~~** undeleted **after ~~objects of~~** a prior communication cycle before the external command is processed.

12. (**currently amended**) The apparatus of claim 10, wherein the memory management unit, if the command includes a memory write command or an object delete command, and if there is a list **including addresses** of objects to be deleted from the memory before the write or delete command is processed, performs the deletion of the objects together with the write or delete command.

13. (**currently amended**) A computer readable medium having recorded thereon a computer readable program for performing a garbage data collection method performed during a communication cycle of a plurality of communication cycles of a computing device having memory including writeable non-volatile memory, the garbage data collection method comprising:

performing a mark phase during a communication cycle, the mark phase for making a first list**, the first list being an address list including addresses** of objects to be deleted from **~~the entire writeable non-volatile memory space~~ the memory**;

performing a first sweep phase during the communication cycle **~~for deleting the listed objects of~~ to delete objects listed in** the first list from the memory, wherein the performing of the sweep phase comprises:

calculating a residual time up to a predetermined time limit after processing an external command;

after calculating the residual time, deleting **~~the listed objects of the~~ objects listed in the** first list from the memory within the calculated residual time; and

updating the first list **~~of objects of those undeleted~~ to include addresses of remaining** objects **listed in the ~~of the~~** first list **which cannot be deleted within ~~after the lapse of~~** the calculated residual time, and storing the updated first list in the

memory **separately from the objects so as to prevent deletion of the first list.**

~~**and wherein, if the objects to be deleted remain after performing the mark phase and the first sweep phase during the communication cycle, performing only a sweep phase during subsequent communication cycles until all the objects of the first list are deleted from the memory.**~~